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(54) Title: CATALYST FOR DIMETHYL ETHER SYNTHESIS AND ITS PREPARATION METHODS

(57) Abstract: This invention relates to a catalyst for synthesis of dimethyl ether and its preparation methods. More specifically, this invention relates to a catalyst with improved formulation for a highly efficient synthesis of dimethyl ether via dehydration of methanol. These catalysts are composed of hydrophobic zeolites, cations selected from alkali metal, alkaline earth metal, or ammonium along with alumina, silica, or silica-alumina. The methods of manufacturing the catalyst of this invention include (a) combining hydrophobic zeolites and precursors of alkali or alkaline earth metal cations with pastes of inorganic binders (at least one selected from the group consisting of bohemites, silica sol, and clay) and calcining the mixture at high temperature; (b) combining particles, which are obtained by calcining the hydrophobic zeolites impregnated with precursors of alkali or alkaline earth metal cations, with pastes of inorganic binders (at least one selected from bohemites, silica sol, and clay) and calcining the mixture at high temperature; (c) combining hydrophobic zeolites with pastes of inorganic binders (at least one selected from the group consisting of bohemites, silica sol, and clay), calcining the mixture at high temperature, impregnating the calcined product with precursors of ammonium cations and calcining the mixture at high temperature. The catalysts of this invention provide significantly high yields of dimethyl ether because they do not result in the production of hydrocarbon side products and their high catalytic activities are maintained for a prolonged period of time.

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